



# L1CFT-L1MU Commissioning

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for the L1MU group



# Status

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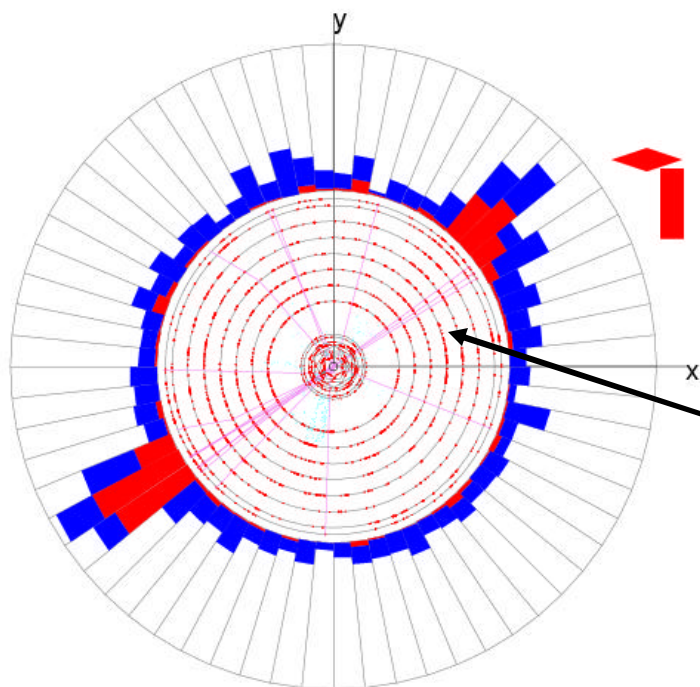
- All central L1CFT-L1MU cables tested
  - ◆ One problem xmitter on sector 69
  - ◆ ~6/388 suspect splitter -> MTCxx
- Small amount of data collected with L1CFT.L1MU trigger
  - ◆ Good results seen in event displays
- GUI's constructed to easily allow shifters to disable all/some of the L1CFT inputs
- DD/AS OK'd two stores of running with L1CFT inputs enabled
  - ◆ Ran all owl shift last night with no problems, will run again tonight
  - ◆ Important because we want to see if there are any gross L1CFT input problems during typical store
- Central and forward L1CFT.L1MU FPGA logic ready to go (but possibly not optimized)
  - ◆ Need central bottom



# L1CFT.Scintillator Commissioning

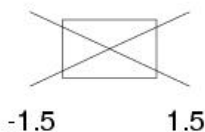
Run 165897 Event 14247346 Wed Oct 16 12:58:30 2002

ET scale: 12 GeV



Muon scintillator  
hits

High  $P_T$  tracks  
from L1CFT



Event collected with mu1pt1clxx



# Shifter GUI (Crate Reload)

Crate controls	PDT masks	MDT masks	SCI masks	CFT masks
<h2>L1 Muon Crate Panel</h2>				
crate id	crate commands			crate status
MCNNA	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
MCNNB	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
MCNSA	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
MCNSB	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
MCNC	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
MTCC	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
MTCH	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
MTCS	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
MTM	<input type="button" value="cold start"/>	<input type="button" value="restore"/>	<input type="button" value="check"/>	<input type="button" value="offline"/> not touched
<input type="button" value="cold start all crates"/>				
command status				
<input type="button" value="reset masks"/>		<input type="button" value="write trigger mask files"/>		<input type="button" value="exit no write"/>



# Shifter GUI

## (L1CFT Input Disable)

Crate controls   PDT masks   MDT masks   SCI masks   CFT masks

CFT test config

octant 0	<input checked="" type="checkbox"/> 0	<input checked="" type="checkbox"/> 1	<input checked="" type="checkbox"/> 2	<input checked="" type="checkbox"/> 3	<input checked="" type="checkbox"/> 4	<input checked="" type="checkbox"/> 5	<input checked="" type="checkbox"/> 6	<input checked="" type="checkbox"/> 7	<input checked="" type="checkbox"/> 8	<input checked="" type="checkbox"/> 9
octant 1	<input checked="" type="checkbox"/> 10	<input checked="" type="checkbox"/> 11	<input checked="" type="checkbox"/> 12	<input checked="" type="checkbox"/> 13	<input checked="" type="checkbox"/> 14	<input checked="" type="checkbox"/> 15	<input checked="" type="checkbox"/> 16	<input checked="" type="checkbox"/> 17	<input checked="" type="checkbox"/> 18	<input checked="" type="checkbox"/> 19
octant 2	<input checked="" type="checkbox"/> 20	<input checked="" type="checkbox"/> 21	<input checked="" type="checkbox"/> 22	<input checked="" type="checkbox"/> 23	<input checked="" type="checkbox"/> 24	<input checked="" type="checkbox"/> 25	<input checked="" type="checkbox"/> 26	<input checked="" type="checkbox"/> 27	<input checked="" type="checkbox"/> 28	<input checked="" type="checkbox"/> 29
octant 3	<input checked="" type="checkbox"/> 30	<input checked="" type="checkbox"/> 31	<input checked="" type="checkbox"/> 32	<input checked="" type="checkbox"/> 33	<input checked="" type="checkbox"/> 34	<input checked="" type="checkbox"/> 35	<input checked="" type="checkbox"/> 36	<input checked="" type="checkbox"/> 37	<input checked="" type="checkbox"/> 38	<input checked="" type="checkbox"/> 39
octant 4	<input checked="" type="checkbox"/> 40	<input checked="" type="checkbox"/> 41	<input checked="" type="checkbox"/> 42	<input checked="" type="checkbox"/> 43	<input checked="" type="checkbox"/> 44	<input checked="" type="checkbox"/> 45	<input checked="" type="checkbox"/> 46	<input checked="" type="checkbox"/> 47	<input checked="" type="checkbox"/> 48	<input checked="" type="checkbox"/> 49
octant 5	<input checked="" type="checkbox"/> 50	<input checked="" type="checkbox"/> 51	<input checked="" type="checkbox"/> 52	<input checked="" type="checkbox"/> 53	<input checked="" type="checkbox"/> 54	<input checked="" type="checkbox"/> 55	<input checked="" type="checkbox"/> 56	<input checked="" type="checkbox"/> 57	<input checked="" type="checkbox"/> 58	<input checked="" type="checkbox"/> 59
octant 6	<input checked="" type="checkbox"/> 60	<input checked="" type="checkbox"/> 61	<input checked="" type="checkbox"/> 62	<input checked="" type="checkbox"/> 63	<input checked="" type="checkbox"/> 64	<input checked="" type="checkbox"/> 65	<input checked="" type="checkbox"/> 66	<input checked="" type="checkbox"/> 67	<input checked="" type="checkbox"/> 68	<input type="checkbox"/> 69
octant 7	<input checked="" type="checkbox"/> 70	<input checked="" type="checkbox"/> 71	<input checked="" type="checkbox"/> 72	<input checked="" type="checkbox"/> 73	<input checked="" type="checkbox"/> 74	<input checked="" type="checkbox"/> 75	<input checked="" type="checkbox"/> 76	<input checked="" type="checkbox"/> 77	<input checked="" type="checkbox"/> 78	<input checked="" type="checkbox"/> 79

kill all cft inputs

reset masks   write trigger mask files   exit no write



# L1CFT-L1MU Certification Plan

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- These are the same tasks that we have followed in certifying scintillator and wire triggers
- Important for Lipton et al to press DØ management to allow L1CFT inputs to be enabled during stores
  - ◆ Probably some loss of data-taking efficiency but increases rate of progress in L1CFT-L1MU certification
- Stefan Anderson (postdoc) slated to lead this effort
  - ◆ With help from Rob, Noah, Jeff, KJ



# L1CFT-L1MU Certification Plan

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- Produce MC efficiencies for L1CFT.L1MU triggers
  - ◆ Waiting for p13.03 geometry
  - ◆ Eventually we will rewrite this section of `tsim_l1muo` to make it more RCP-based
- Produce data efficiencies and purity for L1CFT.L1MU triggers
  - ◆  $\text{Eff} == \text{L1MU trigger} / \text{Reco muon}$  for jet triggers
  - ◆ Root-tuple analysis code ready to go
  - ◆ TMB analysis code must wait for p13.04 (or later) when trigger chunk is included (Kyle Stevenson)



# L1CFT-L1MU Certification Plan

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- Measure L1CFT.L1MU rates and rejections
  - ◆ Easily done if L1CFT inputs enabled
  - ◆ Also measure rates for each sector and each octant
  - ◆ Trigger Rate (Hz)  
+++++++ +++++++  
pt1 loose 350  
pt2 loose 45  
pt3 loose 10  
pt4 loose 2  
pt2 tight 3  
pt3 tight 1  
pt4 tight 0.2  
pt4 only 65
- Collect nice event displays with L1CFT.L1MU trigger
  - ◆ Impress your colleagues
  - ◆ More importantly, study events to optimize trigger (improve efficiency and/or rejection)





# L1CFT-L1MU Certification Plan

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- Hardware-Simulator comparisons
  - ◆ Compare hardware result with raw data run through tsim\_l1muo result
  - ◆ Running tsim\_l1l2 (p13.02) online
  - ◆ Track down discrepancies (but for scintillator and wire triggers there was >90% agreement from the start)
- Complete L1CFT-L1MU cable repairs



## Conclusions

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- L1CFT.L1MU commissioning plan is the same one we followed in successfully commissioning scintillator and wire triggers
- Can proceed once L1CFT inputs are enabled
  - ◆ Help from CFT shifters to monitor? I.e., checking for good synch gap at DFEA via DFE\_Ware
  - ◆ SCL Inits after CFT downloads (to re-synch inputs at L1Muo)
- Data analysis using TMB must be developed
  - ◆ Increase commissioning time